AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (original)   A method for obtaining reproducibility of the retention times of the components of a mixture to be analysed in an apparatus for gaschromatographic analysis provided with a capillary column, when one or more of the following variations occurs: a variation in the length of the column, or alternatively replacement of the column with a column having identical real specifications with the exception of the length, and/or a variation in the output pressure from said column, given that the pneumatic resistance $KC_{old} = K(L_{old})$ of said column is known, the analytical expression of which is:

$$K(L_{old}) = \frac{256 \cdot L_{old}}{\pi \cdot d^4} \cdot \frac{\eta_0 \cdot P_{ref}}{T_{ref}^{1+a}} \qquad (9)$$

where:

d is the diameter of the column;

Pref, Tref are, respectively, the reference pressure and the reference temperature (referred to standard conditions);

η_0 is the viscosity of the carrier gas at the reference conditions;

L_{old} is the initial length of the column;

α is the coefficient depending upon the type of carrier gas used;

and in which the temperature of said capillary column is maintained equal, instant by instant, starting from the introduction of the mixture into the apparatus, for each

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analysis of said mixture before and after one of said variations, characterized by the following steps:

- measuring, prior to said variations, the pressure $p_{i,old}$ of the carrier gas at the input section of the column, and the pressure $p_{o,old}$ of the carrier gas at the output section of the column;

- following upon said variations, measuring the new

  pneumatic resistance KC_{new} $K(L_{new})$ of the column, the analytical

  expression of which is:

$$K(L_{new}) = \frac{256 \cdot L_{new}}{\pi \cdot d^4} \cdot \frac{\eta_0 \cdot P_{ref}}{T_{ref}^{1+\alpha}} \qquad (5)$$

wherein:

L_{new} is the new length of the column;

- selecting, after said variations, the new pressure $p_{o,new}$ at output from the

  column;

- calculating a new input pressure $p_{i,new}$ or a new mass flow F_{new} (referred to

  standard conditions) of the carrier gas, using the relation:

$$\lambda = \frac{j_{old}}{j_{new}} \cdot g \frac{P_{o,new}}{P_{o,old}} \qquad (1)$$

where:

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$$g = \frac{K(L_{new})}{K(L_{old})} = \frac{L_{new}}{L_{old}} \quad (2)$$

$$j_{new} = \frac{3}{2} \cdot \frac{\left(\frac{p_{i,new}}{p_{o,new}}\right)^2 - 1}{\left(\frac{p_{i,new}}{p_{o,new}}\right)^3 - 1} \quad (3)$$

$$j_{old} = \frac{3}{2} \cdot \frac{\left(\frac{p_{i,old}}{p_{o,old}}\right)^2 - 1}{\left(\frac{p_{i,old}}{p_{o,old}}\right)^3 - 1} \quad (4)$$

- setting, after said variations, said new input pressure $p_{i,new}$ or said new mass flow F_{new} of the carrier gas into said apparatus for gaschromatographic analysis in correlation to λ.

2. (original)   The method according to Claim 1, in which said method the following steps:

- storing the known quantities $K(L_{old})$, $K(L_{new})$, $p_{i,old}$, $p_{o,old}$, $p_{o,new}$ in electronic means for storage of said apparatus for gaschromatographic analysis;

- storing the relation λ in said electronic storage means;

- using λ for calculating and entering said quantity F_{new} or

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$p_{i,new}$;

- providing means for setting and control of the input pressure $p_{i,new}$ and/or

of the flow rate F_{new} in said apparatus for analysis.

3. (currently amended)   The method according to ~~either~~ Claim 1 ~~or Claim 2~~, in which for calculation of said input pressure $p_{i,new}$ the following relation is used:

$$p_{i,new} = \sqrt{p_{o,new}^2 + \lambda \cdot g \cdot \left(p_{i,old}^2 - p_{o,old}^2\right)} \qquad (6)$$

4. (currently amended)   The method according to Claim 1 ~~or Claim 2~~, in which for calculation of said mass flow F_{new}, the following steps are envisaged:

- measuring the mass flow F_{old}, referred to standard conditions,

of the carrier gas before said variations;

- calculating said quantity F_{new} using the relation:

$$F_{new} = F_{old} \cdot \lambda \qquad (7)$$

5. (currently amended)   The method according to ~~either~~ Claim 1 ~~or Claim 2~~, in which for the calculation of said mass flow F_{new}, there are envisaged the steps of:

- measuring, before said variations, the temperature T_{col} of the capillary

column;

- calculating the mass flow F_{old}, referred to standard conditions, of the carrier

gas before said variations, using the relation:

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$$F_{old} = \frac{p_{i,old}^2 - p_{o,old}^2}{KC_{old} \cdot T_{col}^{1+\alpha}} \qquad (8)$$

where:

α is the coefficient depending upon the type of carrier gas used;

$KC_{old} = K(L_{old})$ is the pneumatic resistance of the column according to relation (5) of Claim 1;

- calculating said quantity F_{new}, using the relation:

$$F_{new} = F_{old} \cdot \lambda \qquad (6).$$

6. (currently amended)   The method according to Claim 4 or 5, in which, if the temperature of said capillary column follows a trend which varies in time, the flow F_{old} is measured or calculated instant by instant, and the flow F_{new} is calculated instant by instant.

7. (currently amended)   The method according to any one of the preceding claims Claim 1, in which said quantities $KC_{old} = K(L_{old})$ and $KC_{new} = K(L_{new})$ are measured by means of blank tests of said gaschromatographic apparatus.

8. (currently amended)   An apparatus for gaschromatographic analysis provided with a capillary column that can undergo variation in the length of the column or be replaced with a column having identical real specifications with the exception of

the length, and comprising:

- means for measuring the pressure $p_{i,old}$ of the carrier gas at the input section of the column;

- means for storing the quantities measured, or in any case known, $p_{i,old}$ (pressure of the carrier gas at input) and $p_{o.old}$ (pressure of the carrier gas at output), and the quantities:

  $K(L_{old})$, pneumatic resistance of the non-modified column, and $K(L_{new})$ pneumatic resistance of the column after modification of the length of said column;

- storage and processing means for calculating a new input pressure $p_{i,new}$ or a new mass flow F_{new} (referred to standard conditions) of the carrier gas, according to the method claimed ~~in any one of Claims 1 to 7~~ Claim 1; as well as

- means for setting and control of the input pressure $p_{i,new}$ and/or of the flow F_{new}.

9. (original)   The apparatus according to Claim 8, characterized in that it comprises means for measuring the mass flow F_{old} or F_{new}.

10. (currently amended)   The apparatus according to ~~either~~ Claim 8 ~~or Claim 9~~, characterized in that said means for setting and control of the input pressure $p_{i,new}$ and/or of the flow F_{new} are operatively connected to said storage and processing means.

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11. (currently amended)   The apparatus according to ~~any one of Claims 8, 9 and 10~~ Claim 8, characterized in that it comprises means for the storage of the quantities $p_{o,old}$, the known value of the output pressure for the nonmodified column, and $p_{o,new}$, the value of the pressure set at output for the modified column.

12. (currently amended)   The apparatus according to ~~any one of Claims 8 to 11~~ Claim 8, characterized in that it likewise comprises means for measuring the output pressure from the column of the carrier gas $p_{o,old}$ or $p_{o,new}$.

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